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Science and Technology for Tomorrow's Air and Space Force

Success Story

F-117 STUDY EXPANDS FIGHTER PILOT FATIGUE KNOWLEDGE



Scientists with the Human Effectiveness Directorate at Brooks City-Base, Texas, conducted a study that may help military aviators combat the performance-degrading effects of fatigue during long-duration missions. Warfighters will benefit from this study designed to improve mission performance among aircrews in all types of aircraft, whether they are transport planes, bombers, fighters, or helicopters.



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Accomplishment

The directorate's Warfighter Fatigue Countermeasures Team conducted the study to assess several fatigue factors using 10 F-117 pilots at Holloman Air Force Base, New Mexico. The research revealed that pilots who flew simulators for 37-hour missions experienced marked fatigue-related problems. The study showed their basic flight skills had degraded to 40% below normal due to the imposed sleep loss.

This is an important finding because researchers have long assumed that basic flight capabilities are extremely resistant to operational stressors such as fatigue. The study also indicated the most serious fatigue-related decrements occurred not in the predawn hours as many had expected, but were observable much later in the day, even as late as 2 to 3 p.m., after 32 hours without sleep. Furthermore, the sleep-deprived pilots were often unable to reliably self-assess their alertness and readiness to perform.

During the study, no one "crashed" the simulator, but it became clear that untreated fatigue could seriously impair operational readiness at unexpected times without the pilot's knowledge. The results provide a baseline for improving aircrew-sustained operations risk analysis and validating fatigue countermeasures. These counterfatigue strategies will include sleep schedule changes, behavioral remedies, and pharmaceutical aids designed to enhance performance while preventing mishaps.

Background

According to US Air Force Safety Center data, nearly 8% of reported Class A Air Force mishaps during the past 30 years have been partially caused by aircrew fatigue. Army aviation did not fare much better, with 4% of their Class A-C aviation mishaps between 1990 and 1999 also fatigue related. Today's ever-escalating operational tempo requires implementation of effective, scientifically validated fatigue countermeasures to keep aviators alert without sacrificing safety.

Additional information

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTC, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (04-HE-06)

Human Effectiveness
Support to the Warfighter